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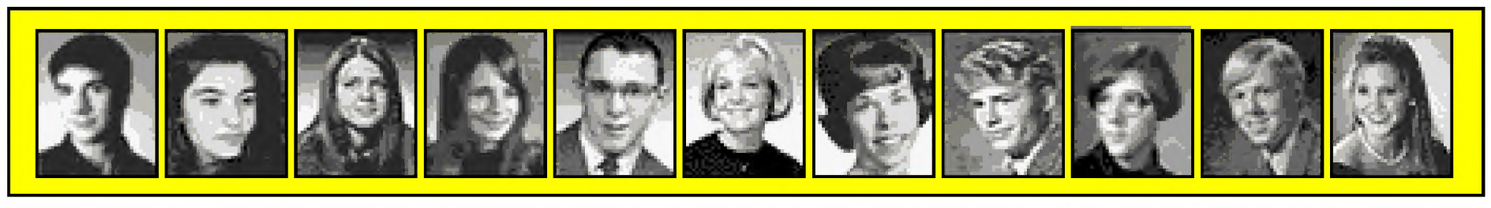

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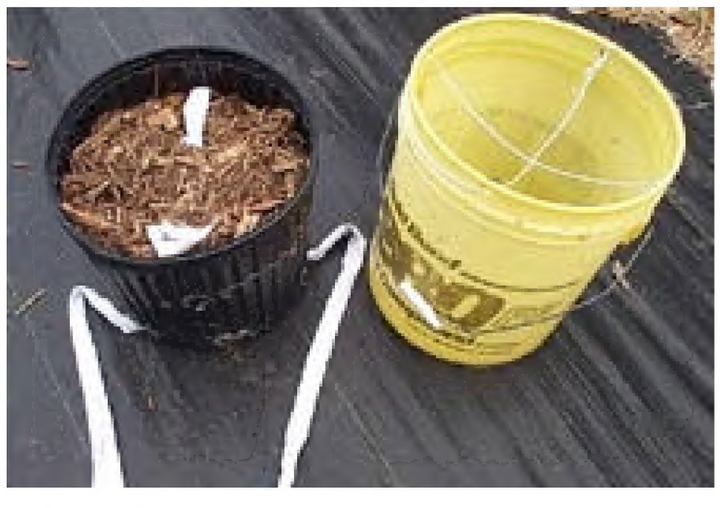
HOW TO BUILD YOUR OWN SYSTEM ECONOMICALLY

WICK, RAFT, and DRIP SYSTEMS

WICK SYSTEM

The wick system is the simplest of all hydroponic systems. It has no moving parts, and consists of a plastic nursery pot with some wood chips,or perlite,or pea gravel,or grow rocks or other medium, a plastic bucket, and a wick. It is best to use a bucket that once held food products, or a new one. The wicks can be made from any old cotton cloth. An old cotton "t" shirt cut into 2 inch wide strips long enough to reach from the bottom of the bucket to the top of the pot works well. Put 2 or 3 wicks in the medium, out the holes in the bottom of the pot to the bottom of the bucket. Add nutrient to the bucket until the level is slightly below the bottom of the pot. Plant some seed touching one of the wicks and watch it grow. Any number of things can be substituted for the pot and bucket shown above.



Bucket, pot, and wicks. Insert wicks,add cypress chips Add nutrient

RAFT SYSTEM

are two examples of raft systems. The first, a 5 gallon bucket can be used to grow 5 or 6 small plants or 1 large plant. The second, a childs swimming pool can be used to grow many small plants or 4 or 5 large. The pool with a piece of 1/2 inch stryofoam cut to fit approximately 1 inch down from the top rim will grow 40 bib lettuce plants.(The stryofoam in the photo is a broken piece. It should be round and the size of the pool.) In addition to growing plants for

consumption, the system is a good seed starter for other types of hydroponic systems. An aerator is usually necessary in a raft system in order to maintain oxygen levels in the nutrient high enough for healthy plant growth.

The top(left) and the bottom (right) of a raft that can be directly seeded. The holes are 9/16th inch with cotton balls inserted. Notice that the cotton ball extends slightly below the bottom of the raft. This allows the cotton ball to act as a wick keeping the seed damp until roots extend down into the nutrient. To plant the seed, place the raft on top of the nutrient, push the seed just far enough into the cotton ball to cover it. Usually with small plants, the nutrient present at the beginning is sufficient to grow the plants to maturity. If for some reason, the raft does not fall with the nutrient level, there is no problem, because the roots will grow down to the nutrient. The cotton balls used were purchased from a Dollar General store at 500 for $1.

The top(left) and the bottom(right) of a raft using an alternative to the cotton balls. The styrofoam cup(an old used McDonald coffee cup)is particially filled with woodchips or coarse saw dust or other non-toxic material that will act as a partial wick. A small piece so old T shirt could be used as a wick until roots reach the bottom where nutrient is available. A small slit is cut on each side of the bottom to let the nutrient in and the roots out.

BUILDING A DRIP SYSTEM

Material list:
4---6 inch x 6 ft x 3/4 inch treated fence boards from Home Depot.
1---8 ft x 2 in x 3/4 inch furring strip
16---1 1/4 inch exterior screws
12---2 inch exterior screws
6 mil plastic sheeting or greenhouse covering 30 inches x 7 ft
Ground cloth 2 ft x 6 ft and 3 ft x 3 ft
plastic or fiberglass screen 3 ft diameter
1---1/2 inch PVC pipe 6 ft long
1---1/2 inch PVC end cap
1---1/2 in PVC x 1/2 in pipe
4---inches 3/8 od (1/8th id) vinyl tubing
Small amount of black or dark paint
3 feet of 1/2 in garden hose
1---30 gallon garbage can
1 submersable pump. Maxi-jet 750 or Rio 600
4---3 gallon nursery pots
1---2 cubic ft bag of cypress chips

Basic materials to build channel to hold four 3 gallon pots in drip system. I chose these materials because of either their availability or

cost. The fence boards cost 99 cents(US) each at Home Depot. The furring strip was 80 cents,(I substituted a couple pieces of scrap 1x4 for part of the furring strip), the plastic is greenhouse covering, but could be common 6 mil plastic sheeting if protected from the sun. The ground cloth is used to keep the sun from hitting the nutrient,and help hold the pots in place. This prevents algae growth. Any non metal material that will block the sun could be used. There are any number of substutite materials that could be used instead of the ones shown as long as the basic rules of no toxic material or any metal other than stanless steel in contact with the nutrient.

Cut 5 pieces of the 1x2 furring strip 1 1/2 inches wider than 2 of the fence boards. This will give you a 3/4 inch lip on each side to help hold the sides. On a flat surface, adjust the furring strips at each end of the boards with the other two evenly spaced between them. Run the screws through the boards to the furring strip, using 2 of the 1 1/4 inch screws per board per furring strip(16 total). Depending on the wood you use it might be necessary to drill the screw holes first. There is no problem if the boards do not fit well together because the plastic will be the water tight seal.

Set one side in place and place a 2 inch screw sideways through the side board into the bottom board at each furring strip. (you will probably need to drill first to insure that the screw goes straight into the bottom board) After both sides are installed, place the 5th piece of furring strip on one end. Run screws through the furring strip into the ends of the side pieces. (An extra board could be purchased and cut and used for the end board making the end the same height as the sides) This will help to prevent

the nutrient from backing out the upper end and also help stabilize the side. pieces.

Place the plastic on top of the finished wood trough and fit to the shape of the trough. This can be easily done by using a couple pieces of scrap 2x4 or similar shaped object that does not have sharp edges. Gently use the 2x4s to fit the plastic into the bottom edges of the trough. One on each side. Fit the plastic to the furring strip end allow the excess to extend out from the outlet end. This gives you a channel for the nutrient falling into the garbage can. When fitted, staple the plastic on the top of the side boards and end furring strip. One staple per foot is sufficient to hold it. Be very carefull not to puncture the plastic any where other than where the staples go through.

Prepare the groung cloth by burning round holes about the same diameter as the bottom of the pots you will use. On a 6 ft long piece of ground cloth burn the correct diameter hole beginning 1 inch in from the ends at about the center of the width. After the two end holes are finished, place two more equally spaced between the end holes. Staple the ground cloth on the top of the side boards with the holes alligned both length and width. This finishes the channel construction.

The cypress chips are placed into the pots and the pots are placed into the channel. I have

never had to buy a black nursery pot as shown. There are an abundance of them free if one knows where to look. The stores that sell plants in the pots always have some around that did not sell or the plant died. They will usually be happy to have someone take them. Another source is people who buy the plants, put them in the ground and then throw the pot in the garbage. I often see them setting out on garbage pickup day. There is any number of types of wood chips that can be used. Pea gravel can be used , but it can be quite heavy. If money is no problem, there are expanded clay grow rocks that work very well. Cypress happens to be the cheapest medium where I live.

The drippers are made from 1/2 inch pieces of 3/16th inch OD vinyl tubing pushed into 1/2 inch thinwall PVC. Cut the PVC to a length where the ends are above the first and last pot, tap an end cap on each end.(glue is not needed) Lay the PVC on the pots and mark the center of each pot on the PVC. Drill a hole slightly less than 3/16th inch at each mark and slip a 1/2 inch piece of the 3/16th inch OD vinyl tubing 1/4 inch into the PVC. They probably will not leak around the tube, but if they do it will just fall into the pot. The inlet end cap is drilled slightly less than 1/2 inch in the center of the cap. A piece of 1/2 in OD vinyl tubing 3 inches long is cut. When using a 1/2 inch ID garden hose to the pump, the 1/2 inch OD vinyl tube will fit tight inside the garden hose on one end and into the hole drilled in the end cap on the other end. Push them together tight so sunlight doesn't hit the vinyl tube and grow algae inside. Don't worry about it leaking because if it is cut to the correct length, the fitting will be above one of the pots. If the first 3/16th inch vinyl feed tube is placed about 1 inch from the inlet end of the 1/2 inch PVC , the inlet

fitting will be over the first pot, and any dripping will just fall into the pot. The same is true for the last pot. In actual practice,I have no leaks. I use thinwall PVC which lets enough light through for algae growth, so I paint the PVC and 3/16th OD vinyl tubing black. For those growing in a hot area, painting white over the black PVC will help keep nutrient temperatures down. If I did not paint it, it would plug with algae in a matter of days. Thick wall PVC (sch 40) might block the light, but I have never used it. In all cases I run 2 channels side by side,(8 pots) so I need 2 of everything.

A plastic or fiberglass screen is placed over the nutrient tank (garbage can) This serves two purposes. It stops anything from falling into the nutrient tank that might cause the pump to stop

working. It also keeps mosquitoes and other water breeding insects out of the nutrient tank. In some cases it will also keep your dog from drinking the nutrient mix. Be sure that the screen is below the top of the can so the nutrient doesn't splash out as it falls to the tank.

The last step is to cover the nutrient tank with the 3 ft x 3 ft ground cloth. I usually put 2 small nails in the top of the side boards and tie the ground cloth with string. You must be able to open it every couple of days to replenish the nutrient that has been used. Any place that the sun makes contact with the nutrient, algae will grow. Algae also will grow on top of the pots, but causes no problems.

The above information is provided for those new to hobby hydroponics and those who might want to try a different system. In some cases the information might not be relevent for use in a commercial operation.

BUILDING NFT,DFT,and FLOOD and DRAIN SYSTEMS

GETTING STARTED GROWING

MY HYDROPONIC GARDEN

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BUILDING NFT,DFT,and FLOOD and DRAIN SYSTEMS

NFT (nutrient film technique) operates on the theroy of a thin sheet of water traveling on a flat surface touching only the bottom roots of a plant. Many commercial growers use this system. Two good sources for home built systems are vinyl gutter, and vinyl down spouts. The down spouts are probably better because you do not have to construct a top for them, but most are no more than 3 inches wide and restricted to smaller plants. Do not use aluminum gutter or down spouts for hydroponics. It is possible that one might find larger vinyl down spouts that could be used for any size plant.
7/8th inch holes are drilled on the top of the down spout 8 inches apart. This distance will accomidate most plants that can be grown in a down spout. Sleeves made of 1/2 inch thinwall PVC cut 1 1/4 inches long with one end flared out will fit into the holes and give the plant more stability. The down spouts shown are resting on 1 inch PVC with a drop of 1/2 inch/foot to insure nutrient flow. Eash tube is fed with 1/4 inch od plastic tubing. This will give about 1 to 2 quarts/minute nutrient flow which is about right for NFT. On the inlet end a piece of stiff plastic is glued in the bottom half to prevent nutrient from leaking out the inlet end. The outlet end is suspended over a 30 gallon garbage can that catches the free falling nutrient. In the bottom of the can is a 170 GPH submersible aquarium pump. The pump runs 24 hours/day when first planted, and from daylight to dark when the root have begun to grow well. There is a piece of wood tied

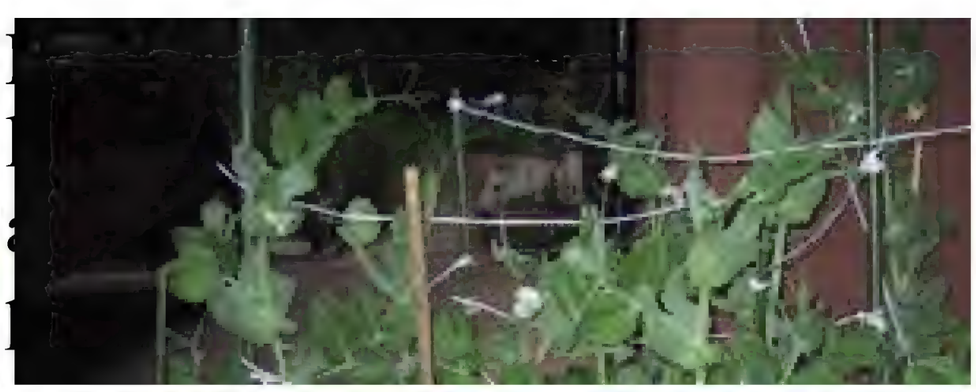
across the top to prevent the down spout from rolling over as the plants get large.

DFT SYSTEM

DFT (Deep flow technique) Almost identical to NFT, except a round PVC pipe is used causing the water to be deeper in the center of the pipe. Under high temperature conditions, this can cause an oxygen deficiency in the roots, but under normal conditions, the system works very well. 7/8th inch holes are drilled cross ways near the top so a piece of 1/2 inch PVC pipe can slide through 3 or 4 pieces locking them together so they do not roll. In the picture, the locking PVC is half way down the pipe. 4 inch thinwall PVC can be used to grow most plants. The roots will not back up the nutrient as long as no more than 1 to 2 quarts per minute is used. For the larger plants 1 1/16 inch holes are drilled and 3/4 inch thinwall PVC sleeves are used.

The advantage of the NFT and DFT systens described above is excellent growing conditions without need for medium, plus simplicity. The main disadvantage is the necessity of growing plants in some type system until they are large enough for the roots to reach the nutrient flow, and the short life of the plants should the pump quit or the nutrient be lost.

FLOOD AND DRAIN



in
flood and drain system

Photos of Flood and Drain systems contributed by Stan in Oregon.

For more information on Stan's hydroponic garden see his web site at
Stan's Web Page

Flood and drain is a common used hydroponic system that has individual containers or a large single growing area usually with some type of medium to help secure the plant roots and help hold moisture during drain cycles. The medium is flooded for a short period, them allowed to drain. The flood cycle should be long enough to bring the nutrient level to just below the top of the medium, then the drain cycle should be as long as possible without stressing the plants for lack of moisture. The weather, size of the plants and the type medium used will determine the length of the drain cycle. Some of the mediums that can be used are listed under Wick systems. An overflow of some type is necessary to take the excess nutrient back to the tank. The nutrient is pumped up into the system during flooding and when the pump stops, the nutrient drains back through the fill line to the tank. The fill line should be the lowest point in the growing area to insure total drainage. The advantage of this system is that any plant will grow well in it.

SLEEVES

The sleeves used in the NFT and DFT systems to hold and stabalize the plants can be made by cutting 1/2 in and 3/4 in thinwall PVC into 1 1/4 inch piecies, then flare one end by compressing in a vice with a piece of metal that is round, tapered

like a cone and larger on one end than the PVC tube, until one end expands outward as pictured. These sleeves will fit good into the 7/8th and 1 1/16th inch holes in the downspouts and 4 inch PVC pipe.

NUTRIENT TANKS

There are a number of things that can be used for nutrient tanks. A 32 gallon garbage can that can be purchased from K Mart for $7 or $8 does a good job. One of the best this grower has found is a 56 gallon plastic drum used for fruit juice concentrate. It is safe, holds up well in the sun and can be used in a number of ways. It can be cut half for for 2 26 gallon tanks, can have a hole cut in the top for a 56 gallon tank, or laid on it's side for a low 50 gallon tank. If available, the used drums are usually reasonable priced. The one shown was $4. If one looks in the right places, there are no doubt other used food containers that would make excellent tanks.

A drum set up and ready to start. Pieces of screen are held in place with 2 old 1 gallon pots. This keeps debris out of the tank and prevents mosquitos from breeding in the nutrient. The center hole is used to add water and nutrients and check nutrient levels is also covered with a small pot. The tank will be painted white to help keep nutrient temperatures down. If this were a cold climate, I would paint it black to try to raise nutrient temperatures.

The above information is provided for those new to hobby hydroponics and those who might want to try a different system. In some cases the information might not be relevent for use in a commercial operation.

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GETTING STARTED GROWING

The following information is provided for anyone new to hydroponics, or those interested in a different method of growing. Most of the information is based on 20 years of experience in hobby hydroponic growing. The methods shown are not necessary the best or the only way to grow, but have been proven to be successful in actual practice.

After one aquires a hydroponic system of some type, the question arises "Where do I start?"

Without doubt, the most important aspect of a hydroponic system is a good water supply. For those lucky enough to have a water supply that has little or no carbonates and other dissolved solids that plants cannot use have half of the battle won. Those on a municipal water supply can usually grow without too many problems.

Carbonates cause the PH to rise, which if excessive must be controlled.
Other dissolved solids that are not used by the plants will build up to a point where the nutrient must be changed or the plants will suffer. The frequency of changing nutrient depends on the amount of dissolved solids and the amount of water that must be added over a given period. When the amount of water added is equil to the original, the unusable elements in the tank will have doubled.
For those with good water and a meter to measure nutrient strength, there is usually never a need to change nutrient.

MEASURING and CONTROLLING PH

There are several methods of measuring PH. There are kits sold where one adds so many drops of a liquid to a sample of water, then a color scale will give the approximately PH. There is litmus paper that when dipped into the nutrient will change color depending on the PH. There are meters that measure PH, which are by far the most expensive method of measurement.
As a rule of thumb, if one can keep the Ph between 5 and 7, very few if any PH problems will arise.
If the PH is running too high, your plants will be the first to tell you. The effect of high PH is the inability of the plant to pick up minor elements, with iron being the first to show up. An iron deficiency shows as pale yellowing young leaves with the ribs in the leaf looking normal.
A brief note about identifying minor element deficiencies: It is very difficult to identify precisely what element is deficient. This author from experience, adds a broad spectrum of chleated minor elements when any deficiency shows itself. In most cases, it solves the problem.
This addition of chelated minor elements will sometimes compensate for a slightly higher than normal PH when the plants show a minor element deficiency.

If one has a high amount of carbonates in the water supply, the control of PH is probably necessary.
The addition of acid is the only way to control high PH. This is where it gets tricky.
It is highly recommended that anyone who plans to use acids to control PH review the rules for handling acids.
The two best acids to add are nitric and phosphoric. The danger of using nitric acid cannot be over emphisize. No one should ever attempt to use nitric acid unless he/she has a great deal of experience

with acids. Nitric acid is most unforgiving if it accidently makes contact with eyes or skin, or the fumes are breathed.
With all that said, if one has water very high in carbonates and the proper acid handling experience, nitric acid is the best way to go. Phosphoric acid is the next best choice. It is not as dangerous as nitric, but it is still a strong acid and should be handled with caution as all strong acids should. I read another url posting that there is a reasonable priced source for phosphoric acid. It was listed as a dairy equipment cleaning acid called Monarch CIP acid, which is available at farm stores. I have never seen this product and know nothing about it, but it might be worth while for someone who is interested to check it out. If you decide to try the product, read the label carefully and be certain that there isn't any chemical that might be harmfull to plants or people.
Two other acids that are occasionally used by some individuals, mostly due to their availability rather than their desireability are Sulfuric acid (battery acid) and hydrochloric acid (used in swimming pools). These are both strong acids and are dangerous if mishandled. The undesireable aspects of these acids in a hydroponic system are the addition of chlorides and sulfides to the nutrient. Both can be toxic to plants if concentrations are high enough.
Another source of PH control is called PH UP and PH DOWN. These are basically weak solutions of acids or alkalines that are sold by hydroponic shops. Most are expensive to purchase.
There are a number of household acids that have been used. These include aspirin, vinegar(acetic acid), and citric acid. It is quite possible that if one of these acids cured a high PH problem that the problem was not that serious to begin with.

With some water sources, low PH can be a problem. Although not near as common as high PH, it could be a problem that must be dealt with. The best compound for low PH is potassium hydroxide, but like nitric acid, it is a very dangerous chemical to handle. It is similar to lye(sodium hydroxide).

If it is known for sure that low PH is causing a problem, one might try adding a small amount of hydrated agriculture lime. This would in effect be adding carbonates to the nutrient. This might be an unorthodox approach, but at least it is safe.

Two other solutions to bad water are bottled water and a reverse osmosis filtering system. Either of these methods can be very expensive.

FERTILIZER FOR NUTRIENT SOLUTION

One of the questions that comes up for new hydroponic growers is what to use for fertilizer. A fertilizer that is designed for use in soil is usually not suited for hydroponics, although some can be used. A fertilizer must be water soluable in order to be usuable in hydroponics.
The nitrogen source is the most important. Urea nitrogen found in soil use fertilizer will not work in hydroponics. Ammonia nitrogen will work, but often cause the growth to be too rapid for healthy plants. Potassium nitrate, and calcium nitrate are the best forms for hydroponic growing.
There are three choices for fertilizer.
1. Use commercial hydroponic fertilizers. Advantage--excellent quality and reasonable cost. Disadvantage--difficult to find and comes in 25 lb bags and must be used with calcium nitrate which comes in 50 lb bags. There are two sold in the US. Peters Hydrosol 5-11-26 and Plantex 7-11-27 hydroponic. It is possible that there are more. Calcium nitrate is sold at any commercial nursery supply. This is your best bet for fertilizer.
2. Speciality fertilizers from hydroponic shops. Advantage--good quality, many come in liquid form, and are available almost anywhere. Disadvantage--expensive.
3. A water soluable fertilizer with minor elements that is as close to

hydroponic fertilizer as you can find. None will be perfect, and will always have something in them that is not ideal, but many will work and produce decent plant growth. Advantage--reasonable cost and good availability. Disadvantage--All have something in them that is not ideal for hydroponics. Miracle Gro is probably the most used in this catagory.

For those who do not have access to commercial fertilizers, the best place I have found to purchase a good quality fertilizer at a somewhat reasonable cost is at www.hydro-gardens.com. I have never used their products, but the company has a good reputation.

If you are using a hydroponic fertilizer that has directions for use, by all means follow those directions, but most fertilizers do not have directions.
If you use a commercial hydroponic fertilizer or a near substitute not designed for hydroponics, you can probably get by using 3/4 to 1 tea spoon of basic fertilizer with 1/4th teaspoon each of calcium nitrate and epson salts(magnesium sulfate)per gallon of water.
This will result in an EC of approximately 1.4 to 2.0
There are lists showing the optimum level of fertilizer for each different plant. Example: lettuce likes 0.8 to 1.2 EC while peppers like 1.8 to 2.2 EC. This does not mean that the plant will not grow at levels above or below those recommended. Those numbers are ideal, but plants are very versitle in that they will often grow under near adverse conditions. If one is trying to make a living growing hydroponic vegetables, those numbers are important, but if one is a backyard gardner growing vegetables for his own table, use the numbers as a guide only. It probably would not be the best idea to mix lettuce that perfers 0.8 EC with tomatoes with an Ec of 3.0 or 4.0.
Most plants will grow reasonably well with the amount of fertilizer recommended above, with the exception of tomatoes.
The above amount is fine until the tomatoes begin setting on the

plant, then double or triple the amount of everything. In order to avoid blossom end rot, tomatoes need a lot of calcium, so increase the calcium nitrate. In order to produce high sugar contents in tomatoes, the EC must be above 2.5. Tomatoes are very salt tolerant and are seldom ever bothered by high nutrient concentrations.

The question will eventually come up:Should I purchase a meter to measure nutrient strength?

The purchase of a meter to measure nutrient strength might be the most expensive item in a hydroponic system. The cost usually falls into the $75 to $100 range. It is one of those things that is nice to have, but not absolutely necessary. Without the use of a meter, the changing of nutrient periodically is advisable. One possible rule of thumb is to change the nutrient when you have replaced two times the water held in your tank. In other words: if you have a 20 gallon tank and the water level drops to 10 gallon, replace the 10 gallons with the same amount fertilizer per gallon as the original unless you are growing under hot conditions. Use about 1/4th to 1/2 the amount of original fertilizer when replacing under hot conditions. The 4th time this is done, 40 gallons have been added. At this time when the nutrient drops to a low level, dump it and start over as in the beginning. In many places, the quality of the water is such that it is necessary to change it anyway. Under these conditions it is difficult to justify $100 for a meter.
Not to be overlooked when guessing about changing nutrient is the condition of the plants. If the plants are looking good and growing normal, chances are that the nutrient is within the tolerance limits for those plants.
On the other hand if you have excellent water and are growing a lot of vegetables, a meter will give you control of nutrient strengths, and probably allow you to go an entire crop cycle without changing the nutrient.

SEEDS

There are seeds that are specially bred for hydroponic growing, but as a hobby grower, common garden seed are just as good or better, because commercial seeds often are bred for amount of production and looks at the expense of taste. Whatever tomato taste best to you when grown in soil will grow as good or better in hydroponics.

PUMPS

One last item: purchasing pumps. There is no doubt that on line aquarium supply stores are the most econimical source for pumps. This author uses both Rio 600 and maxi-jet 750 pumps, but I am sure there are others just as good. Both work well, but the Rio in usually slightly cheaper to purchase. I did a quick search of the internet in March, 2001 and found three places that have reasonably priced pumps. http://www.graystonecreations.com, http://www.aquadirect.com, http://www.marinedepot.com I have never done business with any of these companys, but they appear to be valid sites. If one has time, a thorough search might find a better store with better prices.

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FALL and WINTER 2000

Broccoli with roots in sleeve ready to plant in DFT system.

Broccoli in DFT system. Notice the locking bar directly behind the plant. This prevents the PVC pipe from rolling when plants get large.

Cole crops in 1 gallon pots in drip system. Black ground cloth keeps sun out of nutrient preventing algae growth.

65 days later. Broccoli head measured 9 inches across. Cole crops did very well in a drip system.

Cherry tomatoes in drip system.

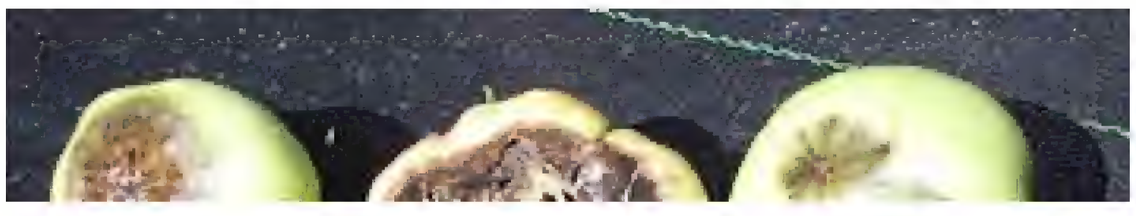
SPRING and SUMMER 2001

Seed planted in early February in heated containers with potting soil. Plants bare rooted and placed in hydroponics from mid to late March. Temperatures: Average morning lows 65 degrees F Average daytime highs 80 degrees F Growth has been rapid due to mild temperatures.

By mid April, tomatoes, cantalopes, and watermelon have set fruits. The following photos were taken in mid April.

Tomatoes in drip system using cypress chips as medium. Varieties include Brandywine, Cherokee purple, Better boy , Big boy bush, and Sun gold. The Sun gold are cherry tomatoes and grown because they ripen 2 to 3 weeks ahead of other varieties.

Tomatoes in DFT with nutrient flow rate of 2 quarts per minute. Growth rate is nearly identical to those in the drip system. The DFT produces fewer problems and is easier to maintain than the drip system until nutrient temperatures go over 90 degrees F. Then keeping oxygen levels high enough becomes a problem.



Late April. Blossom end rot in tomatoes. This is what happens

when you allow your calcium levels to drop too low. If you have this situation, pull off the affected tomatoes, then add more calcium nitrate to the nutrient, or spray plants twice weekly with a 10% calcium chloride solution at 3 tablespoons per gallon.

Cantalope and watermelon in drip system. This is my first attempt at growing these. The vines are growing about 6 inches per day. I have not yet solved the problem of how to support the fruit that forms before the vines reach the ground. The watermelon are supposed to reach 25 lbs each.

Late April. Rapidly growing cantalope and watermellon. They are 4 to 6 inches in diameter already. I have to find a bigger space before growing them again. The vines are covering everything near them.

grown in drip systems always looks as if some minor element is missing, but in the end it always produces excellent corn.

Mid May:Corn will be ready to eat in about 10 days.

Squash (Zucchi and yellow straight

neck)
in drip system. Squash is always slow getting started, but will cover the entire area once it starts growing fast.

Late April. Already eating squash, with many more on the plants.

Mid May. 62 Sungold cherry tomatoes on a single stem.

BUILDING WICK,RAFT,and DRIP SYSTEMS

BUILDING NFT,DFT,and FLOOD and DRAIN SYSTEMS

GETTING STARTED GROWING

HOME

Comments or Questions